Teleflex INCORPORATED
automotive group
700 Stephenson Hwy.
Troy, MI 48083-1122

LABORATORY REPORT

Subject: 1997 CHRYSLER "AN" TRUCK SHIFTER

T.A. No.: 3597

Report Type: BENCH - DESIGN VERIFICATION

File No.: 74S7010D.JK2

Part Number(s): 974J-S7010

Date: October 15, 1996

Title: DESIGN VERIFICATION OF 1997 "AN" TRUCK SHIFTER CONTROL ASSEMBLY

OBJECTIVE:

Determine if the shifter assembly withstands 889N abusive loading without any failure of components. Note: Efficiencies and lash were not recorded for this test.

SAMPLE DESCRIPTION:

Quantity	Sample Numbers	Part Number	Product Level	Test Performed
6	T96-3293 - T96-3298	974J-S7010	Rev 4	Abusive Loading

SUMMARY:

All six samples monitored with a switch for cycle counts readjusted (failed) before the first 100 cycles at 93°C.

PROCEDURE:

Data Collection Abusive Test

Data is collected at the start and end of test for both stations.

1) Remove air cylinders and pin adaptors from fixture.

2) Install linear drive, lvdt, and load cell on fixture.

3) Record 89 N efficiency.
   a) Disconnect transmission terminal from lash pin.
   b) Remove lash pin from fixture.
   c) Snap column end terminal onto pin on load cell.
   d) Attach trans pin and load hanger to transmission terminal.
   e) Attach 89 N weight to transmission end.
   f) Start linear drive and collect data with HP plotter using manual mode.
   g) Efficiency is calculated as input load (load created by 89 N dead weight) divided by output load (load at linear drive). The efficiency is calculated from the loads recorded while the dead weight is lifted.
   h) Disconnect transmission terminal from weight and load cell.

Distribution: Sales ( ), Reliability ( ), Manufacturing ( ), Library (1), Project File (1),

cc: W. Bates, O. Iwasiuk

Signed: Joseph R. Karas — Joseph R. Karas, Senior Lab Technician

Concurred: Scott Taggart — Scott Taggart, Lab Supervisor

PROCEDURE: (continued)

Data Collection Abusive Test

4) Record 17.8 N lash.
   a) Reattach transmission terminal pin onto test fixture.
   b) Snap the transmission terminal onto the lash pin.
   c) Set linear drive speed to the minimum setting.
   d) Start linear drive and collect data with HP plotter using manual record mode.
   e) Lash is calculated as the travel at the column terminal when the control is cycled between 17.8 N tension and 17.8 N compression.

Abusive Test Cycling

1) Set up durability fixture for cycling.
   a) Remove the linear drive from the test fixture.
   b) Reconnect the air cylinders on the test fixture.
   c) Attach cycling switch to midconduit adjuster.
      When adjuster slips the foil link is broken stopping counter.

2) Set 89 N abusive load for cycling.
   a) Attach 2224 N load cell and adaptor to shifter at the column terminal.
   b) Start air cylinder and collect data with HP plotter using manual record mode.
   c) Adjust air pressure until 89 N load is meet.

3) Start the test and run per the following test parameters:
   a) Cycle rate is 20 cycles per minute.
   b) Cycle sequence is:
      60 minute soak at 121°C.
      5000 cycles at 121°C.
      30 minute ramp to 23°C.
      5000 cycles at 23°C.
      30 minute ramp to -40°C.
      5000 cycles at -40°C.

OBSERVATIONS:

T96-3293

Adjuster set at adjust position opposite shipping position.
Adjuster stripped during test after 5 cycles at 93°C. (25 cycles for set-up at 23°C)

T96-3294

Adjuster set at adjust position opposite shipping position.
Adjuster stripped during test after 10 cycles at 93°C. (25 cycles for set-up at 23°C)

T96-3295

Adjuster set at adjust position opposite shipping position.
Adjuster stripped during test after 14 cycles at 93°C. (30 cycles for set-up at 23°C)

LABORATORY REPORT

OBSERVATIONS: (continued)

T96-3296

Adjuster set at adjust position opposite shipping position.
Adjuster stripped during test after 16 cycles at 93°C. (30 cycles for set-up at 23°C)

T96-3297

Adjuster set at adjust position opposite shipping position.
Adjuster stripped during test after 1 cycle at 93°C. (20 cycles for set-up at 23°C)

T96-3298

Adjuster set at adjust position opposite shipping position.
Adjuster stripped during test after 1 cycle at 93°C. (20 cycles for set-up at 23°C)

EQUIPMENT:

XYY Recorder: Hewlett Packer Plotter, Model No. 7090A, Serial No. 2434A00491
Calibration Date 02/15/97
Load Cell: Interface, Model No. SM-500, Serial No. A82937
System calibration done at time of test
Load Cell: Interface, Model No. SM-1000, Serial No. A77944
System calibration done at time of test
Bridge Amp: Gould, Model 11-4123-01, Serial No. 01205-01
System calibration done at time of test